Brunswick Naval Air Station
Brunswick, Maine

Engineering Field Division/Activity:	NORTHDIV
Major Claimant:	CINCLANTFLT
Size:	7,259 Acres
Funding to Date:	$40,134,000
Estimated Funding to Complete:	$35,411,000
Base Mission:	Provides facilities, services, materials and aircraft for submarine warfare
Contaminants:	Benzene, dichlorodiphenyl trichloroethane, PCBs, polynuclear aromatic hydrocarbons, trichloroethane, trichloroethylene, xylene, volatile organic compounds

Number of Sites:		**Relative Risk Ranking of Sites:**			
CERCLA:	18	**High:**	11	**Not Evaluated:**	0
RCRA Corrective Action:	0	**Medium:**	2	**Response Complete:**	1
RCRA UST:	2	**Low:**	6	**Total Sites:**	20
Total Sites:	20				

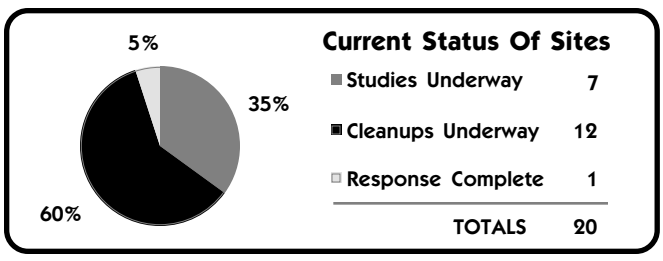
NPL

EXECUTIVE SUMMARY

The Brunswick Naval Air Station (NAS) is located within the town of Brunswick, Maine, approximately two miles east of the city's main business district, in Cumberland County, Maine, five miles inland from the Atlantic Ocean. The air station was commissioned in April 1943 and its size and mission grew during the 1940's and 1950's. The station's current mission is to provide facilities, services, materials, and aircraft for submarine warfare. Typical station operations that contributed to contaminated sites on the facility include operation of an all-weather air station, intermediate aircraft maintenance, material support for maintenance, aircraft fueling services, and explosive ordnance storage and disposal. Prominent site types at the installation include landfills, a groundwater plume, and two Underground Storage Tank (UST) sites. The media most affected by contamination are groundwater and soil. Current operations at the station include pollution prevention technologies to prevent further contamination. The installation was placed on the National Priorities List (NPL) in July 1978. A Federal Facility Agreement (FFA) was signed in 1989 between the Navy and EPA, and revised in 1990 to include the state of Maine.

Contaminants can be transported to streams via surface runoff or can infiltrate into the ground and enter the groundwater system. In the developed portion of the base, most of the natural drainage is directed to the storm sewer system. The potential for migration of contaminants to groundwater is enhanced by the high permeability of surface soils and the shallowness of the bedrock. Because of these factors, contaminants introduced at the surface will enter the groundwater system rapidly. The Brunswick NAS contains a significant amount of undeveloped, natural areas, both woodlands and wetlands. Several endangered animal species may be present in the state of Maine, but none are known to be in the vicinity of the air station.

A Technical Review Committee (TRC) was formed in February 1988 and held regular meetings until it was converted to a Restoration Advisory Board (RAB) in FY95. The first RAB meeting was held on July 19, 1995. Another community group, known as the Brunswick Area Citizens for a Safe Environment, is also active at Brunswick NAS. The Community Relations Plan (CRP) was completed and released to the public in September 1988 with plans for an update in FY96. An Administrative Record and an Information Repository were established in August 1987.



Ten of the 18 CERCLA sites at the NAS were established with an Initial Assessment Study (IAS), equivalent to a Preliminary Assessment (PA), in FY83. Seven additional sites were added with PAs between FY84 and FY94. One site, Site 17, was added without a PA; it started with a Remedial Investigation/Feasibility Study (RI/FS) phase in FY92. Site 10 was transferred out of the Brunswick's Installation Restoration Program (IRP) into the Defense Logistics Agency (DLA) program following the IAS. Site Inspections (SIs) have been completed for 16 sites; 12 sites in FY85 and four more between FY91 and FY95. Fourteen of the seventeen active sites have completed the RI/FS phase; 13 completed in FY91 and one in FY93. The other three sites will complete RI/FS in FY99. All seventeen sites are scheduled for both a Remedial Design (RD) and Remedial Action (RA) phase. Ten sites have completed RD, nine sites in FY93, the other in FY95. The remaining seven RDs will start in FY97 and all will be complete by FY00. The RAs including Final Remedial Actions (FRAs) will follow, one was completed in FY95, one will be complete in FY96 and the remaining CERCLA sites will be completed between FY97 and FY05. There are two RCRA UST sites at Brunswick NAS. UST 2 completed all cleanup work in FY95. The other, UST 1, will complete scheduled cleanup in FY97.

Innovative technologies are being employed, along with conventional cleanup practices, in the restoration of a major contamination concern, the Eastern Plume, which consists of three sites (Site 4, 11 and 13). The Eastern Plume is a groundwater plume of primarily the organic solvents TCA and TCE. An Interim Remedial Action (IRA) for the sites, started in September 1993, consists of extraction, treatment and discharge of the contaminated groundwater. For treatment, the extracted groundwater will be precipitated and filtered to remove iron and manganese, then treated by ultraviolet light and oxidation to remove VOCs, and then discharged into the public Wastewater Treatment Plant (WWTP). Following treatment, Long Term Monitoring (LTM) will continue through FY25. At Site 13, in addition to the groundwater treatment, three underground waste storage tanks were removed and replaced with new tanks. Downgradient monitoring wells have shown decreasing VOC levels since the tank removals and Site 13 is no longer considered a major contributor to the plume.

In FY94, a removal action for soil contaminated with the pesticide DDT was completed at Site 17 using excavation and incineration. No further action is planned for the site, except LTM of groundwater.

BRUNSWICK NAS
RELEVANT ISSUES

ENVIRONMENTAL RISK

HYDROGEOLOGY - Both surface water and groundwater are important at the station. Contaminants can be transported to streams via surface runoff or can infiltrate into the ground and enter the groundwater system. In the developed portions of the base, most of the natural drainage is directed to the storm sewer system. In the undeveloped portions of the facility, runoff enters the surface watershed system. Surface water from the station ultimately flows to nearby wetlands or to the Androscoggin River. The Androscoggin River is the major surface water body in the Brunswick area and one of three major Maine rivers to flow into the Atlantic Ocean. At its closest point, the Androscoggin River is approximately 3,000 feet from the northern boundary of the air station. Groundwater in the Brunswick area occurs both in unconsolidated sediments and in underlying bedrock. The potential for migration of contaminants to groundwater is enhanced by the high permeability of surface soils and the shallowness of the bedrock. Because of these factors, contaminants introduced at the surface will enter the groundwater system rapidly. The direction and flow of the migration is determined by the structural orientation of the fractures in the bedrock. The most productive aquifers in the area are in the unconsolidated sand and gravel aquifers. The aquifers in bedrock produce a limited quantity of groundwater in wells and the groundwater in the bedrock aquifers is under local artesian pressure, which limits the downward migration. The two bedrock wells on the air station are no longer in use.

NATURAL RESOURCES - The Brunswick NAS contains a significant amount of undeveloped, natural areas. These are predominantly woodlands. Roughly 45% of the base is managed as a forest. Much of the area surrounding the air station is also undeveloped. The woodlands afford a suitable habitat for a variety of animals, including deer, squirrel, moose and migratory birds. In the southern area of the base, there are about 90 acres of wetlands and the area immediately south of the station is comprised of tidal coves and wetlands. The tidal wetlands are an ecologically important area used by a variety of aquatic and terrestrial animals. Several endangered animal species may be present in the state of Maine, but none are known to be in the vicinity of the air station.

RISK - A baseline Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA) was performed as part of the Remedial Investigation (RI). The findings were: Sites 1 and 3 (the Landfill Plume) and Sites 4, 11 and 13 (the Eastern Plume) present a current public health risk for groundwater contamination, Sites 8 and 9 present a current health risk for soil and sediment contamination, and Sites 1, 3, 8 and 9 present current risk due to leachate/sediment contamination.

DOD's Relative Risk Ranking system was used to rank the risk factors for all the sites on the installation in FY95. Eleven of the 20 sites at the installation received a high risk ranking. Groundwater contamination was listed as a concern driving the high risk ranking for all eleven sites. The reason for the high groundwater rating was the potential for the contaminants migrating into drinking water wells, and in some cases the groundwater had the potential for off-base migration. Three sites had additional high rating for surface water contamination and one site (Site 9, a former disposal site) also had a high ranking for sediment.

The Agency for Toxic Substance and Disease Registry (ATSDR) performed an initial site scoping visit in April 1991. At that time, ATSDR projected initiating the Health Assessment in FY94, but it has not been performed and no new date has been set.

REGULATORY ISSUES

NATIONAL PRIORITIES LIST - The installation was placed on the National Priorities List (NPL) on 22 July 1987 with a Hazard Ranking System (HRS) score of 43.38. The driving force for placement on the NPL were seven areas, including landfills, storage and disposal sites, where pesticides, solvents and waste oils threatened groundwater, surface water and adjacent wetlands.

LEGAL AGREEMENTS - A Federal Facility Agreement (FFA) was signed in 1989 by the EPA and the Department of the Navy (DON). In 1990, this FFA was revised to include the state of Maine.

PARTNERING - No formal partnering arrangement is in place at Brunswick NAS.

COMMUNITY INVOLVEMENT

RESTORATION ADVISORY BOARD - A Technical Review Committee (TRC) was formed in February 1988 and held regular meetings until it was converted to a Restoration Advisory Board (RAB) in FY95. The first RAB meeting was held on July 19, 1995. The RAB has 24 members, including community members. In addition to the regular quarterly RAB meetings, the Navy schedules technical meetings with the RAB to expedite decision-making and site management. Additional public meetings and fact sheets for public certification started in the FY90 time frame.

A community group known as the Brunswick Area Citizens for a Safe Environment sought out a Technical Assistance Grant (TAG) from EPA with which they hired a consultant (Gerber Associates of Portland, Maine) to provide public oversight of the Navy's environmental remediation actions. This group also participates in TRC meetings and produces a public newsletter. This was the first TAG for a DOD installation.

COMMUNITY RELATIONS PLAN - The Community Relations Plan (CRP) was completed and released to the public in September 1988. NAS Brunswick plans to update the CRP in FY96.

INFORMATION REPOSITORY - An Administrative Record and an Information Repository were established in August 1987. The Information Repository is located at the Brunswick Curtis Memorial Library.

BRUNSWICK NAS
HISTORICAL PROGRESS

FY81

UST 1 - The first site, a RCRA Underground Storage Tank (UST) site was identified during an Initial Site Characterization (ISC), equivalent to a Preliminary Assessment (PA).

FY83

Sites 1-10 - An Initial Assessment Study (IAS), equivalent to a PA, was completed. Ten sites were identified as potentially contaminated areas and all were recommended for further study.
Site 10 - Site 10 (Harpswell Fuel Depot) was dropped from the Installation Restoration Program (IRP) and was transferred to the Defense Logistics Agency (DLA). It does not belong to Brunswick NAS.

FY84

Sites 11-13 - These sites were added to the Installation Restoration Program (IRP) based on information in the IAS completed in FY84. At Site 11, Benezene, Toulene, Exobenzene, Xylene (BTEX) was detected in the groundwater and propellant and chlorinated solvents were detected in the soils. Also during investigation, four buried drums containing unknown liquids were found at the site. At Site 12, nitrates and nitrites were found only in the surface soils. At Site 13, pesticides were found in surface soils, and Volatile Organic Compounds (VOCs) and BTEX detected in the groundwater.

FY85

Sites 1- 9 and 11-13 - Site Inspections (SIs) were completed and Remedial Investigations/Feasibility Studies (RI/FSs) were started for 12 sites.

FY90

Site 17 - NAS Brunswick submitted an Engineering Service Request (ESR) to Naval Facilities Engineering Command, Northern Division (NORTHDIV) to demolish the former Pesticide Shop, Building 95 (Site 17), and determine if any environmental cleanup was necessary.
UST 2 - The second UST site (UST 2) was identified during an ISC and began a Corrective Action Plan (CAP) the same year.

FY91

Site 14 - Site 14 was added as a new site and has completed a PA, SI and RI/FS phase. A geophysical survey using Ground Penetrating Radar (GPR) and a magnetometer failed to reveal any indication of the existence of a dump. Based on the results of the investigation completed in August 1991, no further investigation was recommended for this site, but in FY95 additional phases, a Remedial Design (RD) and Remedial Action (RA), were scheduled for FY00.

FY92

Sites 1, 3, 4, 11 and 13 - Two Records of Decision (RODs) were signed between the EPA and the Department of the Navy (DON) in June 1992. The first ROD, for Sites 1 and 3 (landfills), is for Long Term Monitoring (LTM), which will continue through FY98. The second ROD was for an Interim Remedial Action (IRA) for soil removal, capping and soil vapor treatment, at the Eastern Plume Groundwater Operable Unit (OU), OU1 (Sites 4, 11, and 13).
Sites 15 and 16 - An SI was started for these newly discovered, potential sites.
Site 17 - As part of the RI/FS, sampling was performed at Site 17. The pesticide DDT was found in the soil and in unfiltered groundwater. Once filtered, the groundwater did not contain DDT, indicating that the DDT in the groundwater adheres to the sediment particles and can be filtered out. A Non-Time Critical Removal Action was planned to remove the contaminated soil to an off-site incinerator.
USTs 1 and 2 - The CAP phase, equivalent to an RI/FS, completed for USTs 1 and 2.

FY93

Sites 1, 3, 5, 6 and 8 - RD phases were completed and RA phases, including Final Remedial Actions (FRAs), were started for five sites. At Sites 1 and 3, the FRA will be capping; Sites 5 and 6 will have waste removal and Site 8 will have soil removal actions as the FRA. A ROD for Sites 5, 6 and 8 were signed in August 1993.
Sites 4, 11 and 13 - An RD was completed and the RA phase started. The RA phase will be complete in FY98. An IRA started in September 1993, will consist of extraction, treatment and discharge of the contaminated groundwater. It also includes LTM which will continue through FY25.
Site 17 - The RI/FS and RD phases were completed and the RA phase, along with a FRA for soil incineration, were started. An Environmental Engineering Cost Analysis (EE/CA) was completed 29 November 1992, and the Action Memorandum was signed 12 April 1993.
UST 1 - Five of the seven tanks at the site were removed; the Design (DES) phase was completed; the Implementation (IMP) phase was started and a pilot air sparging system was installed at UST 1 (Fuel Farms).
UST 2 - Three tanks were removed; the DES phase and the IMP phase were started and a pilot air sparging system was installed at UST 2 (Navy Exchange Service Station).

FY94

Site 12 - A ROD recommending no further action for Site 12 was submitted to EPA to close out the site.
Site 17 - A removal action was completed at Site 17 in June 1994.
Site 18 - Site 18 was added as a new site following a completed PA. SI phase also completed FY94.
UST 1 - The final two tanks were removed from UST 1.
UST 2 -At the Navy Exchange Service Station, UST 2, the Navy completed pilot operation and began full-scale operation of an air-sparging system to remediate petroleum hydrocarbon contamination in soils.

PROGRESS DURING FISCAL YEAR 1995

FY95

Sites 1, 3, 5, 6, 8 and 11 - Began construction of a landfill cap at Sites 1 and 3. Excavated material at Sites 5, 6, 8 and 11 and placed it under the cap at Sites 1 and 3.
Sites 1, 3, 4, 11, 13 and 17 - Completed construction of a groundwater pump and treat system using ultra-violet (UV) oxidation for Sites 1, 3, 4, 11 and 13. Performed three rounds of monitoring at these sites, and Site 17.
Site 9 - An RD was complete and the RA phase started. As part of the RA, Long Term Operation (LTO) will continue through FY05. Performed source investigations at disposal site where incinerator ash, solvents, paint sludges, and refuse are present in trenches.
Site 17 - Completed a soil removal action for soil contaminated with the pesticide DDT at Site 17 (Former Pesticide Shop Bldg. 95), where DDT contamination was detected in soils and unfiltered groundwater samples.
UST 2- The IMP phase and three FRAs for groundwater treatment, soil vapor treatment and bioremediation were completed for UST 2.
UST 1 - The IMP phase and three FRAs for groundwater treatment, soil vapor treatment and bioremediation were completed at UST 1. These projects are scheduled for completion in FY97.

BRUNSWICK NAS
PLANS FOR FISCAL YEARS 1996 AND 1997

FY96

Sites 1 and 3 - The landfill cap will be complete.
Sites 1, 3, 5, 6 and 8 - RA phase and FRAs will be complete and two of the five sites will be Response Complete (RC).
Sites 4, 11 and 13 - The Navy plans a final ROD for the Eastern Plume for groundwater treatment.

FY97

Site 2 - Both RD and RA phases will be complete, a final ROD for LTM under CERCLA will be implemented and a LTM Plan will be written.
UST 2 - IMP is expected to be completed.

PROGRESS AND PLANS

CERCLA	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
PA	17							
SI	15	1						
RI/FS	14					3		
RD	9	1		1		1	5	
RA		1	5	1	3		4	3
IRA		1(1)						3(3)
RC	1		2				3	12
Cumulative Response Complete	6%		17%				33%	100%

UST	FY94 and before	FY95	FY96	FY97	FY98	FY99	FY00	FY01 and after
ISC	2							
INV								
CAP	2							
DES	2							
IMP		1		1				
IRA								
RC				2				
Cumulative Response Complete				100%				